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A preliminary study of the importance of the stock for the fishing populace

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Greenland Halibut in Upernavik: a preliminary study of the importance of the stock for the fishing populace

**A study undertaken under the Greenland Climate
Research Centre**

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List of acronyms

APNN	Greenland's Ministry of Hunting, Fishing, and Agriculture
DKK	Danish kroner, the currency in use in Greenland
GA	Greenlandic Employers organisation
ICC	Inter-Circumpolar Council
ITQ	Individual Transferable Quota
KNAPK	Organisation of Greenlandic Fishers and Hunters
SIA	Social Impact Assessment
TAC	Total Allowable Catch

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Executive Summary

This report presents research undertaken with the belief that a need exists for better understanding of the social and cultural importance of the Greenland Halibut (*Reinhardtius hippoglossoides*) fishery to Greenlanders. It was decided the research would focus on one of three coastal Greenland Halibut fishery districts: Upernavik. Upernavik was chosen given the critical importance of Greenland halibut for local fishers and area residents.

The best method for presenting a combination of social and fishery data takes the form of a fishery profile. Additionally, given that the government of Greenland is currently in the midst of proposing changes to the Halibut management structure, the report focuses specifically on potential social impacts of the fishery management plan to coastal fishers.

The degree and consequence of any impact is a function of the characteristics of the fishing community. The critical point is the vulnerability of the community to negative repercussions of the management action and the resilience the community has in being able to absorb these repercussions. Upernavik and Greenlandic fisheries communities are known to be remote and have limited economic opportunities for residents. Consequently, it is important to understand the adaptability and vulnerability of the community in order to successfully anticipate impacts.

Greenland halibut is the most important commercial fish stock for Upernavik residents. In 2010 there were more than 385 fishermen with official licenses for Greenland halibut in Upernavik. There are up to an additional 75 who also fish, however, without paying the license fee. This means that almost half of working age men fish for halibut in the Upernavik district.

Fishing is extremely important in Upernavik for its role in the local, mixed economy. Fishing often provides the cash needed for materials needed for work (hunting and fishing equipment such as bullets, nets, snowmobiles, etc.) and daily living (housing, transport, television, food, etc). Fishing also supports the important local cultural practice of meeting social obligations and reciprocity such as through *kødgaver* (gifting of meat), a practice which remains both culturally and economically important in the smaller settlements.

Currently, the government of Greenland is proposing changes to the management of Greenland halibut for the coastal fishers, including the closing the fishery to new entrants in 2012. Additional changes include the introduction of ITQs for large boats. With little

discussion of where locals will work and live if they can not earn an income from the fishery, or discussion of how the communities may be impacted by the potential consolidation of quota shares into fewer hands (as is seen in all ITQ fisheries), the report suggests that management follows accepted practices of good governance as it introduces its new Greenland halibut plan. Good governance is participatory and is based upon, among other points, social equity, responsiveness, and transparency. It is also responsive to the present and future needs of society. Since the plan has not yet been implemented, however, there is still time to follow good governance practices for the sustainability of not only the Greenland halibut stock, but also for Greenlandic society.

1. Introduction

Upernavik town (72° 47' 13" N 56° 08' 50" W) is the seat of the former Upernavik Municipality. Upernavik amalgamated with other municipalities¹ to form Qaatsuisup Kommune (pop. 17 749) in 2009. The administrative center of the municipal seat is now Ilulissat. The municipality has 1600km of coastline and covers 660,000km². As such, Qaatsuisup is the world's northernmost municipality and covers a land area larger than France. The municipality includes such sites as Ilulissat, famous with tourists, and Thule, home to the US Air base.

Upernavik District itself stretches 450 kilometers from north to south and includes nine smaller settlements in addition to the town of Upernavik, the district's administrative center. Settlement residents primarily earn their living through subsistence hunting and fishing and the informal economy. Some very few works in settlement schools or grocery stores or the local Upernavik Seafood factory.

As of July 2011, there were 1100 residents in the town of Upernavik with 2810 in the entire Upernavik District. Since 1947, the population has more than doubled in size.

Upernavik has all of the important services needed in a town. The airport was completed in 2000 and this has increased their connectedness with the rest of Greenland and the world. As in the past, helicopters continue to connect the town with outer settlements. The Royal Arctic Line schedules a ship to service the town on average three times a month 6 months out of the year. The town's public services include local branch of municipal offices, a hospital, police building, a court building, daycare and pre-school, a school², a school dormitory, an elder home, a brand-new local education and activity center (Piareersarfik) and football pitch, two deep-water quays, Royal Arctic shipping, goods storage, a town dump, Pilersuisoq (public grocery store), and a museum.

In addition, there are a couple of private firms for building and shipping. Currently, there is neither a restaurant nor a pub in the town. Though there is only one Bed and Breakfast, lodging is sometimes available with private firms who have housing for their employees. There is also one private kiosk and a "liquor" store.

The public sector (including Home Rule's Air Greenland as well as the municipality) is the most important employer in Upernavik town. Other key private employers include Upernavik Seafood and Lasø, a large construction firm.

In the northern settlements, most families hunt in the winter on the sea ice in the Melville Bay, and move to temporary camps for summer hunting trips on dinghies. Upernavik district is rich in game: there are seal, narwhale, beluga, walrus and polar bear, and birds in large numbers in the summer. Employment is limited to those who can work in the Upernavik Seafood factory or in the schools or one of the shops.

¹ Qaanaaq, Upernavik, Uummannaq, Qeqertarsuaq, Ilulissat, Qasigiannnguit, Aasiaat and Kangaatsiaq

² 11 grades with approximately 240 students

1.1 Greenland Halibut

The focus of this study is on coastal fishers of Greenland halibut (*Reinhardtius hippoglossoides*). Greenland halibut in the coastal areas is different from many stocks in fisheries management in that it is not considered a spawning stock³. Rather, the fish found in these areas enter when they are young and once they grow, are reluctant to venture back out into shallower waters. Consequently, they can not be “overfished” in the sense that the spawning stock biomass is being reduced. The spawning stock biomass is being reduced by the offshore trawlers, not the inshore fishers. The concern by biologists that the stock is being “overfished” by the coastal fishery is based on the perception the landing size is, on average, getting smaller. Greenland Halibut are fish which continue to grow as they age. Consequently, it is viewed by some that a smaller size means they are being caught before they mature to reproductive age.

The quota, or total allowable catch (TAC), for the inshore Greenland halibut fishing sector has been set at 20,500 tons for the last several years. The first half of 2011 showed a three percent decrease in catch over the same period in 2010 (Statistics Greenland 2011). For the same period, the value of the landings increased from 70 to 100 million DKK.

A more detailed look into the specifics of the Upernavik inshore Greenland halibut fishery is provided in section 4.4 *The coastal fishery*.

1.2 Management

This section presents the official management plan for Greenland Halibut as it was in November 2011⁴. A discussion of these management points presented will follow in the Section Seven.

In 2011, the Ministry of Fishing, Hunting and Agriculture (APNN) recommended changes in the management of Greenland Halibut. Their recommendation came about through a multi-stage process, with some limited stakeholder input.

The Greenland Home Rule government supports APNN's recommendation (September 2011) for new regulations for the coastal fishery for Greenland Halibut in which the TAC is divided into two quotas for each management district – one quota for larger vessels and one quota for small entities. The large vessels are assigned a TAC quota share and on the basis of this share the size of the individual quota is decided upon each year with reference to the TAC. The small vessels will continue to fish in an Olympic⁵ fishery (Government of Greenland 2011).

³ There is some disagreement among scientists on the accuracy of this view. Yet it is the view of those in charge of biological advice from the Greenland Environmental Institute giving advice to the Fisheries Ministry.

⁴ The document referred to is: “Medlem af Naalakkersuisut for Fiskeri, Fangst og Landbrug. 3 september 2011. Sagsnummer 2009-021513. Oplæg til Naalakkersuisut vedrørende regulering af det kystnære fiskeri efter hellefisk”.

⁵ An Olympic fishery refers to one in which fishers race to catch as much as they can in a set period of time. Greenlanders refer to this as an Olympic fishery, though technically it is not given the addition of set quotas.

According to APNN, the coastal fishery for Greenland halibut in the management districts of Upernavik, Ummannaq and Disko Bay are characterised by large structural problems and the income of the individual fisher is in general very low. Though a “low” income is fine for most fishers as it is often supplementary income, management would like higher incomes to increase taxable levels. The Government has also raised the quotas in the management districts of Ummannaq and Upernavik the last couple of years because quotas were fished up approaching the end of the year.

A working group in the Department of Fisheries, Hunting and Agriculture has arranged a series of initial meetings with stakeholders in the fishery (KNAPK (fishermen's organisation), KANUKOKA, (municipalities organisation), Qaasuitsup Municipality and the Greenlandic Institute of Natural Resources). On the basis of this, the working group drafted a description that provides a picture of the fishery and provides a background for the present suggestion for a regulation of the coastal fishery for Greenland halibut.

According to the working group, the regulation shall ensure:

- A structural adaptation of the fishery which will in the long run secure an economically viable fishery for the participants
- To be considerate of small and large vessels in the fishery so that they do not compete directly with each other
- That the number of entities are reduced and that the stress on the biological advice is reduced

It should be noted that the stress on biological advice stems from the fact that extra quotas have been granted that exceeds the biological advice. These extra quotas have generally been granted by the end of the year when actors in the fishery and political opposition in parliament manage to exert sufficient pressure on the decision-makers to raise the total TAC. The problem of stress on the biological advice can thus be perceived as a complicated political problem reflecting a certain power distribution in TAC decision-making.

The legal basis for the introduction of the new regulation of the coastal fishery for Greenland Halibut is found in the fishery law § 10 (see Annex).

The work behind the management plan for Greenland halibut was on-going for over a year and though inadvertently put aside during personnel changes in the department, it is now being pushed forward quickly. During its development, the plan was considered one of the government's concrete initiatives in the regional development strategy (RUS). The implementation of this is expected to contribute to the government reaching its tactical goals for the development of the fishery profession within RUS, which reads:

- To increase the income of the individual fisher through a modernisation of the coastal fleet with the least possible amount of public subsidy

- To increase the profit in the fishery sector and thereby increase the resource rent⁶

Background

Though it is always difficult to get exact numbers of boats in a fishery at any given time, the best estimates put the fleet at 153 vessels with GR-numbers, from now on referred to as large boats, and about 700 small entities, from now on referred to as small boats⁷. The present regulation is based upon standard practices within a TAC system whereby the fishery is conducted in competition among the fishers until the quota is fished up.

In general the regulation can be divided into four points:

- Division of the TAC between large and small vessels
- Regulation of the large vessels
- Regulation of the small vessels
- Consolidation of the three districts into one for management purposes

Division of the TAC between vessel groups

The TAC for each management area will be divided into two quotas – one for the large vessels and one for the small vessels. The division is made on the background of the historical catches of the large and small boats respectively. The presumed advantage of this division is that large and small boats will not compete with each other.

The division currently implies that in the future, a person may have license to either a large boat or a small boat (dinghy), but not both⁸.

Specific regulation of large boats

Large boats are to be assigned a quota share based on their historical catches. The quota size will be calculated each year based on this quota share and the TAC. Quota shares and sizes will be transferrable which means that the fishers who wish to leave the fishery for Greenland halibut can sell their share or quota size. Likewise, the transferability means that fishers can increase their quota share or size by buying from other fishers. The Ministry expects that vessel quota for large boats will allow large-boat fishers to get bank loans in the future, enabling them to better make long-term plans (Government of Greenland 2011). They are furthermore guaranteed a minimum quota and do not risk that the quota will be fished by other fishers in case of illness, technical problems or the like.

⁶ It should be noted that there is no correlation between large vessels and better profit per kilogram. On the contrary, there is a tendency for profits to decrease with larger units, but because of the greater quantity of catch, the total profit for each vessel is greater.

⁷ We get the impression from staff in GFLK and the Fishery Department that more boats and actors participate in the fishery unregistered.

⁸ The staff in the Fishery Department is currently investigating the juridical possibilities of making exceptions to this so that, for example, cutter-owners will have a chance to continue fishery from dog sledge when the sea freezes up.

The preliminary plan for the implementation of individual transferable 2012 quotas is:

- February: announcement of assigned quota size to the vessels
- May: deadline for complaints about the assigned quota size
- July: final announcement of quota sizes after corrections made on the basis of incoming complaints

Until the final quota shares and sizes are decided during 2012, the vessels will fish on the preliminary quota shares and sizes (to be) announced in January 2012.

For those fishing vessels assigned a vessel quota in 2012, there will be two possibilities:

- They can choose to continue in the fishery under the framework of the new regulation.
- They will have the opportunity to sell off their quota-share to other actors in the fishery

Specific regulation of small boats

Small boats will fish in an Olympic fishery⁹. For small-boat owners, the advantage is that this is a known system, with rules and procedures fishers are familiar with, that also gives a high rate of exploitation. At the same time, the most efficient vessels are not subject to limitations on how much they may fish.

To reduce the pressure on the quota reserved for this segment, the fishery will be closed to new entrants. The length of the period of closure to this segment depends on the number of persons that leaves this fishery. This means only persons who had a permanent license in 2011 for the coastal Greenland Halibut fishery will receive a license in 2012. Management expects that as the number of actors in this segment is gradually reduced, the remaining ones will experience an improved economy while pressure on the quota will also be reduced.

Fishing Area Regulations

No limitation on fishing by area is introduced in the management plan. For large boats the advantage is that the quota share is not connected to a certain area, which increases their flexibility. When the total quota for large boats in a management district is fished up, the fishery is closed in that area. The large vessels may therefore be forced to continue the fishery in other management districts to obtain their individual quota.

In principle, the small vessels will also be able to continue fishing in another district when the small boats quota is exhausted in their own management district. In practice, however, only a few of the small boats have this opportunity because of their limited mobility and lack of housing.

⁹ Again, this is the Greenlandic definition of Olympic fishery.

Quota reserve

A quota reserve will be established beginning in 2013. 10 % of the total TAC will not be allocated at the beginning of the year, but instead will be held back as a reserve which can later be divided in a way that is deemed appropriate by the Ministry after consultation with the Fishery Council. The idea behind this move is to give the government the possibility of being flexible without having to raise the TAC

Economic consequences expected intended by management

In 2011 the total TAC in the three management districts was 20,500 tons. Greenland halibut prices are expected to rise from the 2010 average of 7.8 DKK (Danish kroner) per kilogram.¹⁰ The total value of sale for all management districts in 2011 is expected to be at least 160 million DKK. APNN (the fisheries department) has estimated that the sale value for the entire quota will rise to 200 million DKK in 2011 (Government of Greenland 2011).

In the management plan's Appendix (Government of Greenland 2011) on new methods for regulation of the coastal fishery for Greenland halibut, emphasis is placed on the fact that the distribution of the fishery is very uneven. This means that at present large vessels fish a relatively large part of the quota. This did not change considerably in 2010. Five percent of the vessels fished over 1000 tons and 4 % fished between 50-100 tons. This change, which has occurred from 2009 to 2010, was caused by the introduction of license payment where fewer vessels sold fish in 2010.

The fewer number of boats in 2010 does not mean there were fewer fishers, however. An explanation of this is undertaken in the discussion section (Section 7).

Management expects a division of the TAC offers the possibility of greater efficiency among the large vessels without this efficiency being at the expense of the possibilities of the small vessels.

In the management plan (Government of Greenland 2011), it is written that an analysis of the societal-economic consequences is being planned and will be undertaken. Such an analysis would ensure that the political decision-making process was being pro-active in relation to acting upon possible negative effects of the change-processes. It was the intention of the government that the analysis would form the outline for plans of action in areas of labor-market and education, guaranteeing that the released labor (those forced out of fishing) is prepared to improve their qualifications and education and find employment in other professions. The analysis was to be conducted in relation to the Regional Development Strategy in close cooperation with Qaasuitsup Municipality and with participation of the affected departments.

¹⁰ Prices vary from buyer to buyer and bonus-agreements are not included in this average price.

The Department of Fishery, Hunting and Agriculture was responsible for the preparation and handing of the analysis before the end of September 2011. As of December 2011, this socioeconomic analysis had yet to take place.

Administrative consequences

Management expects that the completion of the reform of the regulation of the coastal fishery for Greenland halibut will, when the reform is fully implemented, mean a reduction in their administrative burden connected to the management of the administration of the fishery (Government of Greenland 2011).

Administration of complaints

The management plan also explicitly refers to limiting complaints by fishers. As stated in the plan, experience shows that assignment of individual quota on the basis of historical catches will lead to a considerable number of complaints. It is therefore necessary to determine ahead of time, which criteria that must be fulfilled in order for a complaint to even be allowed to be heard (Government of Greenland 2011).

Communication

Finally, in the management plan it is stated that the affected parties, including KNAPK, Qaasuitsup municipality and GA, will be informed about the content of the new regulation. It is stated explicitly that an information campaign about the changes and its implication for actors in the fishery will be conducted. It was found during interviews with Upernavik fishers, however, that many had not heard of the proposed changes and thus it remains to be seen the extent to which communication is improved (Government of Greenland 2011).

2. Social Impact Assessment

This report provides a background for the Greenland Halibut Fishery and presents current management plans. Given the proposed changes to the management of the stock, a rapid social impact assessment (SIA) of the new plan is presented. SIA is a systematic appraisal of the quality of life of communities and individuals whose environment is affected such fisheries management plans. Social impacts refer to changes to individuals and communities due to some management action that alters the day-to-day way “*in which people live, work, relate to one another, organize to meet their needs, and generally cope as members of a fisheries society*” (Inter-organizational Committee on Guiding Principles for SIA 1994, in Wilson 1998). SIAs assess possible social ramifications and suggest management alternatives or possible mitigation measures. The methodology has been developed through multidisciplinary interactions over several decades, particularly those related to environmental policy.

When looking at stock recovery plans, and social impact and compensation mechanisms, it is imperative that the new distribution of fishing opportunities should remain equitable among all stakeholders; marginal groups should have an equitable distribution of the benefits (Wakefield 2007). In the case of Greenland, the question is how will small coastal boats (dinghies, dog sledges, and snowmobiles) be impacted relative to larger boats? Will the impacts resulting from the proposed management measures be equal and equitable across the different groups? What about the large boats? The introduction of ITQs has historically caused the consolidation of quota into fewer boats. Will this happen in Greenland, as well? How will communities fare with such consolidation of quota into fewer and fewer hands?

It is important to involve all sub-groupings of fishers in the management process and address the social impacts of a management plan on these heterogeneous groups.

2.1 Methods: Social Impact Assessment

For this study, the methodology followed a three stage process: selection of community, fieldwork and analyses.

Selection of SIA of the community

- Investigation and background literature review on the fishery and fishing communities, including earlier sociocultural research.
- Investigation into the overall conditions of the fleet and view of current management conditions.
- Fieldwork investigation to interview key informants.
- Analysis of collected field data in the villages with social impact assessment in mind.

This includes an analysis of the appropriate level for the definition of a “community.” In some cases, a regional profile may be considered more suitable than a port-centered community study. In other cases, a “fishery” such as with some pelagics where ports are spread out over hundred or thousands of kilometers, may be the community (e.g. Wilson

et al. 1998). In the case of Upernavik, we focus on the Upernavik district, with data drawn from interviews with those based in Upernavik town, as well as from outlying settlements.

The second phase involves the fieldwork period conducted primarily with qualitative and social science research methods. In this study, such methods involved

- semi-structured interviews with key individuals, and
- participatory rapid appraisal methods, including hunting and fishing trips.

To focus the research and increase time efficiency given the limited nature of the study, fieldwork often concentrates on the following key indicators, variables and characteristics:

- population characteristics;
- structure and relative importance of the fishing industry within the community;
- community and institutional structures;
- political and social resources;
- individual and family factors; and
- community resources.

When considering a social impact assessment, the above data, are used while focusing the analysis the key issues of economic vulnerability and existence of alternatives (within and without fishing), resilience and adaptability, and community support, all of which provide a background for understanding potential community impacts.

The importance of cultural data cannot be emphasized enough in this sort of assessment. When presented along with socioeconomic information, these data can provide improved understanding of how communities and individuals have, and will be, impacted.

2.2 Types of Socio-economic Data

The methods for socio-cultural impact assessments rely greatly on accessing the data necessary to show the impacts which one hopes to uncover. This section briefly discusses the type of data which should be accessed, as well as the form of presentation of data.

Types of Socio-economic Data

There are three main categories of data types being used within socio-economic research and policy programmes in fisheries management worldwide (Hatchard et al. 2007):

- 1) Industrial, including economic costs and productivity, and fleet and landings statistics;
- 2) Community, including measures of individual and societal well-being; and,
- 3) Institutional, including structural support and governance structures. Components referring to the fishing industry, its communities and its institutions are set within the context of measures of the broader socio-economic context.

2.3 Profiles

Fisheries and Community Profiles provide a qualitative description of the socio-economic circumstances of, for example, a port, community or a coastal region, and are suited to any scale: community, regional, national, or sectoral. Profiles are an ideal format for providing qualitative and social data. Once generated, they have the advantage of serving as a detailed guide for future work, the updating of which is relatively simply and cost-efficient.

The best profiles are based on both qualitative and quantitative data. In the case of Upernavik, data compiled from semi- and unstructured interviews have been combined with socioeconomic and biological quantitative data. Profiles are a means by which a fuller picture of a community or sector can be provided; statistics are useful as a basic starting point but can not explain why things are as they are. Additionally, the inclusion of community members in the research process means that some in community itself will feel some sense of ownership towards the profile and some commitment to the data management process.

3. Adaptability, Vulnerability and Critical Issues

The degree and consequence of any impact is a function of the characteristics of the fishing community. The critical point is the vulnerability of the community to negative repercussions of the management action and the resilience the community has in being able to absorb these repercussions. Upernavik and Greenlandic fisheries communities are known to be remote and have limited economic opportunities for residents. Consequently, it is important to understand the adaptability and vulnerability of the community in order to successfully anticipate impacts.

Previous studies have documented the significance of vulnerability on fishing communities. The first aspect of vulnerability is the existence of alternative activities both within and outside of fishing. Are there alternative activities available to young men who planned to go into the Halibut fishery this year, but now will no longer be able to? The more alternatives available to someone who must change their behavior because of a regulation, the better that person is able to deal with the change.

The second aspect of vulnerability is the economic vulnerability of the fishing industry. This is the amount and sources of pressure and competition those in fishing related businesses face in getting the things they need to run their operations and in selling their products. "The more vulnerable the fish-related operation is, the greater the impact of a regulation on the lives of the people related to that operation" (Wilson et al. 1998). In the case of Upernavik, vulnerability can be seen with the severe limitations on alternative activities. The industry itself, if not as capital intensive, may not be as vulnerable. And in some cases, may benefit from new measures.

The need for understanding of vulnerability within fishing communities is not new idea and has been explored qualitatively in, for example, the United States (e.g. Hall-Arber et al. 2001; McCay and Cieri 2000). In the United States, a loss of fishing infrastructure and the increasing gentrification found within coastal communities makes it difficult for commercial fishers to remain in their traditional place. This has been recognised as a problem along the entire U.S. coast (Gale 1991), making these communities highly susceptible to adverse impacts from fishery management regulation" (Jepson and Jacob 2007). Similar studies have been conducted in other resource-dependent communities, such as those in forestry and mining.

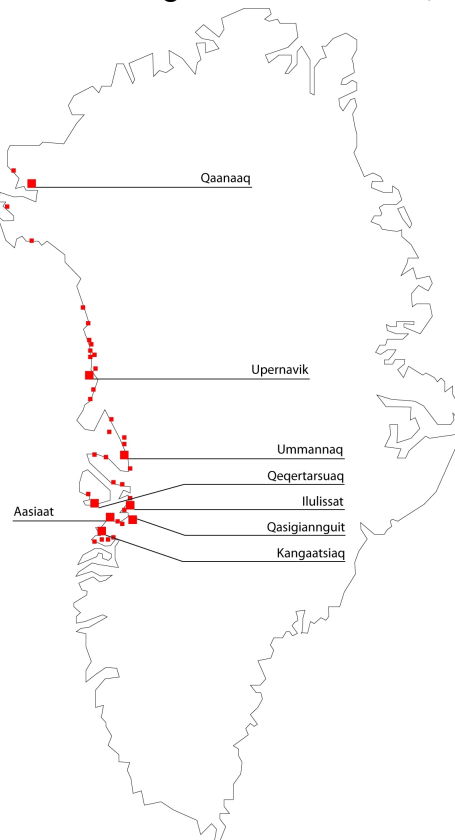
4. Upernavik District Community Profile

4.1 Introduction

Greenland has a large physical territory with a relatively small population. The population of 56,600 residents (2011) is spread around the country, though more than 36 % are concentrated in the two largest cities, Nuuk (15,000) and Sisimiut (5500). There are 17 “cities” found in Greenland, with a city as defined as having between 400 to 15,000 residents. 15 % of the population live in “settlements” with between 25 and 550 residents.

This report focuses on the northernmost area of Greenland in Qaasuitsup Municipality, West Greenland, and Greenland. More specifically the fishery profile focuses on Upernavik town and surrounding settlements. As of July 2011, Upernavik (72°47'13"N 56°08'50"W) had 2815 residents: about 1100 reside in the town itself with 1715 found in the surrounding nine settlements.

Upernavik district ranges from 71° to 74° latitude and encompasses 200,000 km², an area slightly smaller than Great Britain. The hunting area encompasses most of the Melville Bay. The area has a high arctic climate with midnight sun lasting from mid-May to mid-August. A period of darkness lasts from early November to early February in the southern areas of the district.



Locations of settlements and cities in Qaasuitsup Municipality

Currently, the primary activities of economic importance are fishing and hunting. Historically, hunting was the primary economic activity with commercial fishing developed as recently as the 1980s. An airport was built in 2000.

4.2 Population and employment

Qaasuitsup Municipality has a population of 17,749 (2009) with the largest percentage living in Disko Bay. The Disko Bay area, and especially Ilulissat, forms the centre of Greenland's small tourist economy. The Fisheries are also important for this area.

Table 1: Population of Upernavik District*

Population (from south to north)	1977	2011
Upernavik Kujalleq	138	210
Kangersuatsiaq	232	188
Upernavik town (administrative centre)	855	1107
Aappilattoq	142	173
Tussaaq	67	
Naajaat	29	50
Innaarsuit	72	172
Tasiusaq	172	236
Nutaarmiut + Ikerasaarsuk	57	46
Nuussuaq	143	213
Kullorsuaq	186	415
Upernavik district	2093	2810

*Greenland Statistics database, accessed January 2012

Population and employment trends for Upernavik

Upernavik's population has steadily increased over the years. From 1947 to 2011, the population doubled from 1,460 to 2,800 inhabitants. This doubling is despite the Danish, and later the Greenland Home Rule, administration's numerous centralization schemes over the decades. In Greenland in general, the push for a decentralized settlement pattern succeeded with only about 15 % of the population currently living in settlements; in Upernavik on the other hand, over 60 % of the population lives in the nine smaller settlements (Hendriksen and Jørgensen n.d.).

The personal incomes in the Upernavik district are below Greenlandic averages (see Table 2 below), but this is not surprising given the importance of the mixed subsistence livelihood structure followed by the residents of this area. Most families have incomes based on self-employment (see Table 3), a designation which includes hunters and fishers. With self-employment, documented expenses can be deducted from their taxes, thereby making it seem as if they have had little, or no, income (Hendriksen and Jørgensen n.d.) when the reality is a great percentage of the income has gone towards business expenses.

Table 2: Average incomes in selected districts, 2009*.

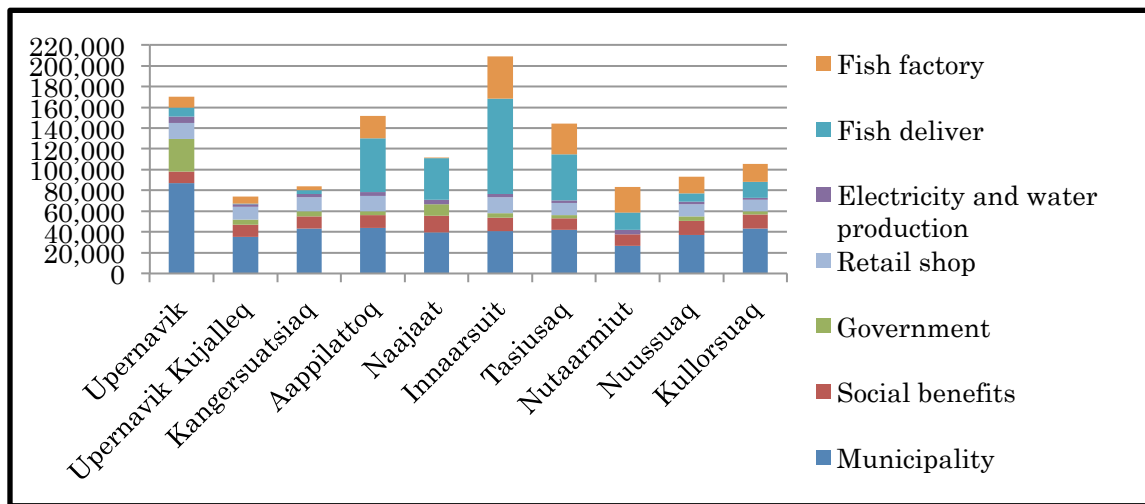
		Gross income in DKK	Taxable income in DKK	After tax income DKK
2009	Greenland	198510	181792	139775
	Ivittuut	479124	456187	307692
	Nuuk	272550	249677	186528
	Sisimiut	208711	192528	146324
	Kangaatsiaq	125025	112869	93862
	Aasiaat	168062	154746	119597
	Ilulissat	180558	164930	127552
	Uummannaq	152553	139635	110687
	Upernavik	139235	127102	102082
	Qaanaaq	121165	108874	90816
	Tasiilaq	137341	122786	103060
	Illoqortoormiut	157435	144853	115667

*Greenland Statistics database, accessed January 2012

Additionally, social service payments are also lower in Upernavik than in other parts of Greenland, and this is partly related to the payback system used by Upernavik Seafood. In this system, social transfers are paid back to the municipality via sales to Upernavik Seafood; a proportion is deducted from a fisherman's sales of Greenland halibut by Upernavik Seafood and this is sent directly to the municipal office.

Table 3 below show the average taxable income and social benefits in Upernavik district per inhabitants aged 18 – 64 distributed on primary income sources 2008. As seen in the table, fisheries related income is significant in the settlements located centrally in the district. For the settlements in the southern and northern part of the district the fisheries have more limited influence on the local economy while the main means of livelihood is hunting and it is remarkable that not public wages or social benefits play a more significant role in these settlements. This can be viewed as documentation of how important hunting is for these settlements. It is also remarkable that in especially Kullorsuaq, Nuusuaq and Upernavik Kujalleq the period of halibut fishing has increased and in spite of the limited fishing income in these settlements, there has been no migration from here to the central settlements.

Table 3: Wages in Upernavik settlements in primary sectors, 2008*



*Hendriksen and Jørgensen n.d.

4.3 History and culture of Upernavik

Native peoples have lived in the area of Upernavik District for at least 4000 years beginning with the nomadic Saqqaq culture. The disappearance of the Saqqa (1000 BC) was followed by the appearance of the Dorset people, another stone-age nomadic group. There are more archaeological remains found from the final group, the Thule culture, which had largely settled in the area from the 13 and 14th Centuries. From this time, the area has been continually inhabited.

There have been few excavations of sites of these peoples in Upernavik, though the local museum has begun to make a site register of sites in the district. The discovery of the Kingittorsuaq Runestone in 1824 also shows that the Upernavik area seems to be the northernmost limit of Viking explorations.

The Danes arrived in the 18th Century and founded the town in the late 18th Century in an area already occupied by local Inuit speakers. Given the harsh environment, the early years were quite unstable; the station was abandoned and re-occupied numerous times. In the 1820s the settlement was re-established as a trade station and Upernavik became a permanent colonial settlement from this time.

The ethnic majority is the native Greenlandic speaking populace. Traditional hunting made up the commercial base of Upernavik for many years. Seals, birds, whales and fish formed the main element of the local people's food, and various mammals were hunted for their skins in order to make clothing. The area population migrated between summer and winter encampments. These individuals, mostly from the northern settlements, followed the winter sea ice in the otherwise deserted Melville Bay and migrated to summer camps, with kayaks and *umiak* (women's boats). Locals still enjoy traveling to summer camps today, though this is on a much smaller scale than the past.

From the early 20th Century, the majority of people in Greenland gradually changed from hunting to fishing as their primary occupation. The transition stemmed from a decline in prices and demand in Danish and international markets for blubber, oil, skin and teeth. At the same time, intensive seal hunting in Canada's Newfoundland Banks and the massive seal hunt in the pack ice along the eastern Greenland by Norwegians reduced the seal population in Greenland in the late 19th and early 20 centuries so dramatically that many people were starving in several districts in Greenland, including Upernavik (Hendriksen and Jørgensen n.d.).

After World War II, Greenland seal herds had increased again to previous levels, but the Danish Greenland administration did not consider hunting livelihood which could serve as a commercial basis for a future, modernised Greenland. In the 1950s and 1960s, Danish biologists and fishermen did not believe there was enough potential in Upernavik district for commercial fishing. Locals were then encouraged to emigrate south so they could engage in cod fishing and work as employees in processing and ancillary industries (Hendriksen and Jørgensen n.d).

The consequence of the Danish administration's policy encouraging migration meant that while intense investments were undertaken to improve living and health conditions in most of Greenland through home construction, improvement of hospitals and health care, and the provision of infrastructure and schools, investments were much smaller in Upernavik district.

The administration's goal of having a significant portion of the population move south did not come to fruition, and Upernavik continued as a hunting district.

Several attempts were made to increase the commercial fishing possibilities in Upernavik over the years and the Greenland Halibut fishery finally took off with government intervention in the early 1980s. Given the severe restrictions on hunting, Upernavik today is more of a fishing society than a hunting one, but only if one looks at official, monetary income. However, residents still very much practice a subsistence economy based on hunting. Fishing often serves to provide income needed in the cash economy while hunting meets household obligations and subsistence needs.

Also, while Upernavik already had a very modest level of government services given its history, these are currently being reduced even further, especially in the smaller, outer settlements.

4.4 The coastal fishery

In Upernavik district, the coastal fishery is conducted with small and large boats in open water; and sledges or snowmobiles during the iced-over period. Dinghy and sledge/snowmobile fishers use long-lines. Most of the large boats also fish with long lines, though they also use drift nets for short periods of the year and in only in restricted areas. In the iced-over period, sledges or snowmobiles are used for fishing with long lines through holes in the ice.

In 2010 there were more than 385 sellers of Greenland halibut in Upernavik. Of these, eleven are considered by the Greenland government as meeting the level of a profitable fishers by the government's definition (further defined on page 21). Another 22 fishermen fished over 30 tons, which is considered full-time by the Greenland government.

The total Greenland Halibut quota for 2010 was 20,500 tons. The Upernavik share of the quota was 6500, but approximately 1500 tons were fished by southerners selling in the south (see Table 4). On average, 60 % of the catch is landed in the summer months and 40 % in winter.

As touched upon earlier, the Greenland halibut stock is not currently overfished in a strict biological sense which empathises stock reproduction. There have been comments by fishers and Upernavik Seafood representatives that "ghost" fishing is thought to be an issue in recent years. In this case, ghost fishing is when drift nets are lost and they continue to catch fish and sea life in the nets as they float in the sea long afterwards. It is not known, however, how large of a problem this is, or may become.

Table 4: Number of fishermen with amounts sold (tons), 2008

Location	Tons											
	200-250	150-200	100-150	50-100	40-50	30-40	20-30	15-20	10-15	5-10	1-5	0-1
Upernavik												
Kujalleq											1	7
Kangersuat-siaq									3		5	1
Upernavik		2	2		1		2	2		5	11	11
Aappilattoq				1	2	2	7	5	7	7	6	4
Naajaat					1		1	1	1	2	9	1
Innaarsuit	1	1	2			1	6	2	5	7	14	3
Tasiusaq		1	1	3			1		3	14	28	7
Nutaarmiut							1	1	1	1	3	2
Nuussuaq										5	28	5
Kullorsuaq							2	2	9	21	29	19
Total	1	4	5	4	4	3	20	13	29	62	134	60

Hendriksen and Jørgensen n.d.

A wide variation in the amount of Greenland halibut caught from fisher to fisher and from settlement to settlement can be seen in the district. Table 4, for example, provides a breakdown of how much is sold per fisher in each of communities in Upernavik district, and highlights the large number of individuals who catch a small amount per fisher.

Table 5 (below),¹¹ provides a breakdown of the distribution of sold Halibut in the settlements for 2008. The table also provides a summary of the percentage of sellers in the populace as well as the average price received for the fish. It is important to point out the table shows where the fisherman is living, but does not actually provide information on where the fish were sold or actually caught.

¹¹ Registered according to the fisherman's home settlement.

Table 5. Distribution of purchased Halibut in kilograms and DKK per inhabitant, potential workforce and fishers in settlements 2008								
	Men, aged 18-64	Population	No. of fisher-men	Purchased in kg.	Purchased in DKK (approx.)	Average DK per men, aged 18-64	Average DKK per inhabitant	Average DKK pr. fisherman
Upernavik Kujalleq	65	204	8	7.721,5	61.000	938	299	7.625
Kangersuatsiaq	67	218	9	47.912,5	383.000	5.716	1.757	42.556
Upernavik	397	1183	36	767.422,5	6.139.000	15.463	5.189	170.528
Aappilattoq	60	186	41	646.255,0	5.170.000	86.167	27.796	126.098
Naajaat	13	53	16	131.497,5	1.052.000	80.923	19.849	65.750
Innaarsuit	50	148	42	1.020.986,0	8.168.000	163.360	55.189	194.476
Tasiusaq	80	261	58	810.326,0	6.483.000	81.038	24.839	111.776
Nutaarmiut	17	56	9	61.557,5	492.000	28.941	8.786	54.667
Nuussuaq	59	210	38	109.933,0	879.000	14.898	4.186	23.132
Kullorsuaq	121	415	82	428.821,5	3.431.000	28.355	8.267	41.841
Total	929	2934	339	4.032.433,0	32.258.000			

From Hendriksen and Jørgensen n.d.

Fishing in Upernavik is almost exclusively a male activity. Indeed, in 2008 all registered sellers/fishers were men. The vast majority of Greenland halibut fishermen are aged 18 to 64, but there are a few older people who continue to fish. There are also some teenagers under the age of 18 who fish.

The vast majority of fishing in the Upernavik district takes place in the sea surrounding the five settlements in the central part of the district; this is also where the majority of the fishermen live. As shown in Table 5. there is wide variation in the importance of Greenland Halibut fishing for individual households. In the two southern-most settlements there is virtually no fishing for halibut. Those who fish from this area, do so primarily near Aappilattoq. In Upernavik, the district's administrative center, most men of working age (18 to 64) find other work while some young people are also continuing education. Consequently the number of fishers, per capita, in this town is lower than in the settlements.

There are a few important additional discussion points necessary surrounding Table 5. In 2008, the seafood buyer plant in Nutaarmiut was closed, and the fishermen had to sell their catch in Tasiusaq.

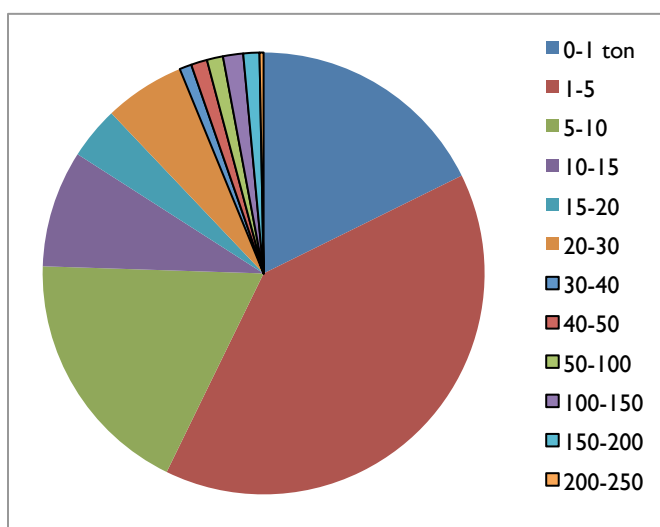
It should also be noted there are natural, environmental limitations based on the time of year and location. For example, first sales at the production plants in Nuussuaq and Kullorsuaq are only possible when the sea is iced over as narwhal scare fish away in the open-ice period of the year. Instead, fishing takes place north of Nutaarmiut and sold either there or in Tasiusaq. Fishers are also often prevented from fishing in the transition period from open-ice to iced-over period which usually takes place in the autumn, though climate change is impacting weather patterns in recent years (Hendriksen and Jørgensen n.d.).

In 2008, there was one large cutter based in the district. There were also about 30 small cutters (27-33 feet in length), which in addition to the owners (skipper), often have one-man crews. In all, 21 of the district's 339 fishermen sold 2165 tons of Greenland halibut in 2008. This means that 21 fishermen sold for about 17 million DKK while the remaining 318 fishermen, fishing primarily from dinghies (and sledges) sold for about 15 million DKK (Hendriksen and Jørgensen n.d.).

In Greenland, APNN has determined that the minimum individual catch for profitable self-employment through fishing is about 30 tons of halibut. This is based on the assumption of a purchasing price at about eight DKK per kilogram. At this rate, gross earnings would come to approximately 240,000 DKK. From this, operating expenses, which usually run about half would be deducted to give the take-home income. This means annual earnings are less than that of an unskilled laborer working full time. In 2008, the minimum annual wage was about 145,000 DKK which APNN sets as the minimum level of acceptable earning in the fishing (Hendriksen and Jørgensen n.d.).

As Table 6 shows, 94 % of the fishermen in Upernavik District sold less fish than the 'minimum profitable catch rate' set by APNN in 2008. Of the total fishermen, 88 % sold less than 20 tons of halibut. This means they officially earned less than two-thirds of APNN's profitable minimum. 76 % of the fishermen sold less than 10 tons, and as many as 57 % less than five tons. Overall, it is common for the majority of settlement fishermen to sell less than 30 tons of Greenland halibut (Hendriksen and Jørgensen n.d.).

Table 6: Size of catch in Upernavik District, per fisherman, in 2008*



*from Hendriksen and Jørgensen n.d.

Table 6 presents, graphically, the percentage of settlement fishermen who sold Greenland halibut in 2008, by tonnage. The small portion outlined in black shows the percentage of

fishermen who landed more than 30 tons of Greenland halibut – APNN's minimum for profitable fishery.

Fishermen do have the ability to catch and land more fish than they do currently. The fact that so many sell less cannot be explained by lack of quota, fish, or lack of money for the necessary equipment. Rather, it can be said to stem from the fact that their identity in relation to earning a living is tied to being hunters, not fishers. This is discussed at greater length in section seven. But briefly for now, residents of the settlements consider themselves to be hunters. Indeed, "Most of their working hours are spent on hunting, and many of them have a reputation for being good hunters" (Hendriksen and Jørgensen n.d.: 18). The identity of being a hunter in this context is related to self-sufficiency, implying that there is limit to their ability to engagement in fishing trade.

Division of labour in the Greenland Halibut coastal fishery

Though there are no female full-time Greenland Halibut fishers, there are a number of women working as part of the seafood buyer plant workforce. Their ability to find employment, however, may at present be limited while the level of processing has decreased, which influence the proportion of female employees at Upernavik Seafood, especially as it is typically men who take the strength-intensive work necessary with handling and freezing (Hendriksen and Jørgensen n.d.).

4.5 Subsistence

Full-time fishers are few in this part of Northern Greenland. Yet, this does not mean that fishing is not important for the locals' personal subsistence and economy, on the contrary. For example, in Upernavik district, of 930 men aged 18 to 64 years, approximately 320, well over one-third, officially sell Greenland Halibut as a part of their household economy. In 2010, there were 385 sellers to Upernavik Seafood, making it about 40 % of the working, male populace.

There is also a relatively large group of hunters who have not purchased a Greenland halibut license, yet do fish. Some of these hunters fish as under the name of other fishermen. They have chosen to do so because they do not catch enough to make paying for the 1,500 DKK license worth the expense. If you include these individuals, the number of fishers catching Greenland halibut is actually probably closer to 400-450. In other words, close to half of the potential male workforce is catching Greenland halibut. If you look only at the outer settlements, and do not include the Upernavik town area, the majority of adult males are most likely catching halibut.

Subsistence hunting and fishing provides an extremely important protein source for settlement householders and in many cases is the only source, even today. Cultural traditions of sharing and reciprocity are also still maintained in Upernavik's outer settlements and have great importance on Greenlandic society and culture. For example, the tradition of *kødgaver* (literally, "gifting of meat") is alive and well, especially in the smaller settlements. For example, if a hunter captures a large mammal such as a whale, polar bear or

walrus, parts are given away to others following traditional allocation formulas found in these smaller settlements. Thus, if a household has no hunters due to illness, age or mental state, the rest of the village ensures that the affected family will have fresh meat (Hendriksen and Jørgensen n.d.).

In these communities there are also culturally accepted rules governing hospitality which must be followed. For example, one of the researchers always found an offering of food whatever time of day, during unannounced and spur-of-the-moment research visits to private, settlement homes. In these instances, what was offered out of the pot or the refrigerator was always locally caught: boiled, dried or fried seal, bird or whale, walrus or polar bear in all variations of prepared form. In very few cases was the offered food halibut or fish and it would never be store-bought meat (Hendriksen and Jørgensen n.d.).

Thanks to catches of Greenland halibut, residents of Upernavik settlements were brought out of economic poverty in the early 1990s. Even so, these increased catches have not made Upernavik a pure fishing district. Most hunters in the district are, according to one Upernavik Seafood informant, 'liquidity fishermen'. By this, it is meant that fisherman fish when they need cash, such as for gasoline, ammunition, rent, clothes for the family, a new engine, computer, TV or other material necessities. The remainder of the time, they support themselves and their family through hunting. This means that their halibut catch-per household can vary greatly from year to year; catches may increase significantly if a new outboard motor is needed, and after that the catch would "fall back to normal levels" (Hendriksen and Jørgensen n.d.).

4.6 Government welfare and transfer payments

Upernavik has one of the lowest percentages per capita of public social transfers in all of Greenland. There are special, local conditions which have enabled this to be the case, the most important of which are the local, mixed economy which includes halibut fishing, and the role of Upernavik Seafood. In Upernavik district, if a hunter receives social assistance for a short while, perhaps due to illness, a bad catch, poor weather or ice conditions, the municipality sends a message to Upernavik Seafood with the amount transferred. Upernavik Seafood makes a note of this and as the welfare recipient lands his catches, Upernavik Seafood will hold back a portion of the money owed to the fishermen and transfer it instead to the municipality (Hendriksen and Jørgensen n.d.). In this way the municipality's social welfare system is really more like a loan fund. Thus, unlike the rest of Greenland where social assistance is generally not paid back, in Upernavik, the funds are partly repaid. It is noteworthy that the population in the district does not perceive the system as unfair, but rather see it as perfectly natural and just: it enables them to retain their pride as self-employed hunters. Of course there are some in the district who do live on social benefits for early retirement and welfare, but overall it is a smaller percentage of the populace on permanent benefits than most of the rest of the country (Hendriksen and Jørgensen n.d.).

Similarly, Upernavik Seafood helps fishers finance new dinghies, outboard motors, snowmobiles or other fishing equipment. Every year, Upernavik Seafood distributes a

number of dinghies or snowmobiles to fishermen which they then have a number of years to pay back from their landing sales. In 2011, there were 10 snowmobiles distributed. A spokesman for Upernavik Seafood said the company is aware that the expense of some of these will probably never be fully recovered because of too little selling by some of the recipients. Nevertheless, the company views the practice as a good investment overall.

5. The Shoreside Sector

The shore side sector is limited to Upernavik Seafood. Upernavik Seafood, owned by Polar Seafood and Royal Greenland, each having a 50 per cent share, has a monopoly on landings in the Upernavik district.

Upernavik Seafood has almost 200 employees in the peak season. Seven work full-time in the office. They have eight Greenland halibut factories in the district. Of these, one is only open in the summer. Two others, storage facilities at Nuussuaq and Kullorsuaq, are only open during the solid ice period; there is no fishing in the area during the open water period due to the fact narwhal scare away halibut at this time of year.

Some of the smaller factories reach capacity quickly; meaning fishers cannot land their fish at this time and must travel to another factory. In any case, fishers must get a number from Upernavik Seafood in order to land the fish at a certain time. This is necessary to ensure the equipment required for landing the fish on the quayside is available.

Under the system used in Greenland, fishers must sell to this one buyer, it is from here that the quota/tonnage is recorded and kept track. In 2010, 5100 tons out of the 6500-ton quota were bought by Upernavik Seafood; almost 1400 tons of the northern quotas were landed further south.

The establishment of these plants by the seafood buyer has given most of the fishermen an additional source of income; a very small smaller proportion of them have even changed from hunters to fishermen.

Much of Upernavik is ice-bound through the winter, which means that fish sold must be stored through the winter until it can be shipped out in the late spring. This increases the operating costs of Upernavik Seafood, causing them to have a lower buying price than some of their competitors further south. Furthermore, fish are shipped and processed in Denmark or low wages countries such as Eastern Europe, taking away an opportunity for value-added work to take place locally.

In addition, it should be noted that the local processing economy is also affected by global markets. The degree of processing and storage varies from year to year, depending on the world market price for Greenland halibut. In recent years, the world market price has been relatively higher for whole fish with skin. This means that most fish is exported unprocessed, even though most processing and storage facilities are equipped to filet the fish, for example (Hendriksen and Jørgensen n.d.).

6. Critical Issues, Adaptability and Vulnerability in the Upernavik context

To understand how vulnerable communities and individuals are to policy changes, two things must happen. First, the context must be understood fully. Second, specific management actions must be evaluated from this context.

The previous sections presented a general background on Upernavik and Upernavik coastal fishers. This next section looks at the critical issues surrounding the vulnerability of Upernavik in the face of APNN's proposed management changes.

First, it is important to note that Greenland Halibut is not actually viewed as being over-fished currently by scientists. APNN is taking a precautionary approach to the management of a stock which is neither threatened nor in crisis. The dynamics of the stock are difficult and not as straight-forward as many other commercial stocks. For example, if it is correct, that there is no reproduction taking place in the fjords as the ministry states - it means that the reproduction take place on the banks, offshore. These offshore areas are actually fished by trawlers, but not by the coastal boats being discussed in this study. Additionally, according to a biologist at the Greenland Nature Institute, offshore fishers have stated that "we have to high-pressure wash out the fry of the trawls". This would seem then, that there may potentially be a sustainability issue with the Greenland halibut. But then it does not seem it is a matter for the inshore area under the Greenland halibut plan, but actually should be tackled in a plan for in the offshore fishery.

Importantly for the 2012 inshore quota, the management plan does not say how the quota will be distributed. The Plan simply states it will be set in 2012. Consequently fishers have not been able to plan ahead, neither for 2012, nor for the actions leading up to 2012 (e.g. in purchasing licenses).

In regard to changes in the management:

- The fishery shall be closed to all new-comers in 2012
- No area restrictions- boats may travel between districts
- The quota is now divided between the two groups
 - small boats continue with an Olympic-style fishery
 - large boats now have transferable quotas
- Boat owners may be in one group only
- 10 % of the quota will be held in reserve, to be distributed at the discretion of government with consultation with the fishery council

Looking at these changes, it is apparent that some Upernavik fishermen will be impacted by the current plans.

There are two critical points to consider when looking at the proposed management plan: the plan does not take into the account the importance of fishery as a part of a mixed subsistence economy; the plan also fails to comment upon the lack of alternative employment and subsistence opportunities when entry into the fishery is closed to them. There

are also a number of smaller points which will be commented upon following the discussion on these first two critical issues.

Upernavik's mixed economy

As mentioned earlier in this report, the coastal Greenland halibut fishery provides many fishers and hunters with a supplementary source of income. As such, the Greenland halibut is vital for providing the cash needed in Upernavik's mixed economy and is in many ways a lynchpin. Hunting, for example, remains vital in the area for meeting sustenance needs and social obligations. The lack of income from selling Greenland halibut could undermine the entire local economy. Though the two most recent governments have attempted to centralize the settlements, and one could argue this is a hidden way to meet that goal, the severe and sudden contraction of local settlements could have far reaching consequences: social transfers would greatly increase; housing availability would not meet the demand in larger towns; stress will be exerted on society and cultural ways of life may be impacted for the worse.

Limited entry into the coastal Greenland halibut fishery

There are two separate newcomer groups to be discussed when considering the issue of limited entry into the coastal Greenland halibut fishery: First, those newcomers who hope to enter the small boat fishery, but must wait for a retirement before they can enter the fishery; and second, the issue of newcomers into an ITQ fishery.

If these young men can not find an entry into the fishery, the question remains what employment will these young men find for themselves in their home settlements if they can not fish (or, fish to pay for hunting, equipment, and housing)? The critical question which must be asked, is what employment will these fishers and young men find for themselves in their home settlements if they can not fish?

There is also the issue of new fishers getting into the ITQ fishery. It must be expected, as shown in others cases around the world, that entrance into ITQ fisheries demands considerably larger investments than non-ITQ fisheries. New fishers will have to purchase a quota share in addition to fishing equipment. They will also need to invest in larger boats in order to make the enterprise profitable and probably need business and accounting training. It is questionable if young men from local small-scale fishery households will have the necessary means. Alternatively, fishers may have the opportunity to organize and purchase quota together as a company, but again, this will require investment into the human capital necessary. Also, partnerships and cooperative work groups sometimes face social and cultural barriers to success; investigation into how such groups can be best served will need to be considered.

Fishing under a shared license

The local practice whereby several fishers fish under one license, under one person's name, is known by APNN. This informal system arose out of financial necessity due to the expense of the license. There are two major problems with this practice in the face of

the proposed management change. First, many fishers do not understand that it will result in a greater tax liability for the license holder -he may end up paying tax for all of those who fish under his name. Though an issue, this problem is not insurmountable. Secondly, and more worryingly, individual fishers who have fished under a “shared” license, they will not be able to get a license in the future even though they are fishing currently. In order to understand the magnitude of impacts of the proposed changes on the local community, management needs to understand the actual situation and the true number of fishers. For example, though official numbers put fishers at just over 385 for 2010 (339 in 2008), research shows there are actually more than this number.

Whether this local practice of sharing licenses was legal or “following the rules” is beside the point and not relevant for a discussion on understanding the impacts of changes of management on livelihoods and communities. The important point is understanding that the true numbers who will be affected in order to mitigate potential negative impacts. The large numbers of fishers fishing under a shared license means that a far greater number of individuals have the potential to be negatively impacted by the plan.

Specifics comments on points in the plan

A few additional comments must be made in regards to the regulation of small boats, on fishery area regulations, as well as the quota reserved.

Regulation of small boats

In the plan, APNN states that there are too many small boats in the coastal fishery. Yet, as the plan stands now, attributing a separate quota to small vessels in each management district will not solve the problem of too many entities in this segment. It will prevent newcomers from entering the fishery, but if, indeed, there are “too many” boats now, will not relieve current pressure. It is therefore still to be expected that by the end of the quota season there will be a pressure from this segment for extra quota as seen in the last several years.

Fishery Area Regulations

Local context and environmental conditions should be considered when making a specific management plan. For example, in late autumn there are often storms and incipient icing. It is extremely dangerous for dinghies to sail past Svartenhug or around Nuusuaq to get to Disko Bay. The reality is most of the large boats based in Ilulissat or farther south, may fish in Uummannaq and Upernavik in the summer, but boat fishermen in the north will most likely be unable to go south.

Quota reserve

The plan proposed that in 2013, 10 % of the 2012 quota will be kept aside in reserve, to be distributed at the discretion of the government. An important question is where the 10 % is coming from: small boats and sledges? Large boats? Critically, the question of “to whom will these 10 % worth of quota go in the future?” raises a number of questions, and begs for transparency in the process to ensure equity and fairness.

Individual Impacts

Thus, it can be suggested that the proposed management plan will have a number of direct impacts on fishers and community members. Some of these impacts may be positive; others will be negative.

- With separate quota for larger and smaller boats, some small-scale fishers will have their quota protected.
- Some small-scale fishers will lose a supplementary, yet vital, source of cash income needed for their mixed economy. Such cash is needed, for example, to purchase hunting equipment (bullets, gasoline, etc.), pay for housing, etc. This income also enables fishers to pay the municipality back for their social transfer payments.
- Those who have fished under a shared license will not be able to fish from 2012.
- The lack of area restrictions, (potentially) places Upernavik dinghy fishers at a disadvantage; southern fishers may come north in the summer and help deplete Upernavik's quota, and then continue to fish in the south where they will have more quota remaining. This can be seen with dinghy fishers and not only the larger boats.
- The closure of the fishery for new entrants will mean younger men coming in to the fishery will have to wait to be able to fish independently, or not fish at all, with no foreseeable means of employment.
- The plan potentially sets up inequity between the two groups: the government states explicitly in their management proposal that large boats will be "guaranteed a minimum quota and do not risk that the quota will be fished by other fishers in case of illness, technical problems or the like." Small-scale fishers are not given the same guarantees, of course.

Community Impacts

The plan will also have far-reaching impacts at the community level. Upernavik is a northern district with a limited amount of alternative livelihood opportunities: if the young men can not fish, what will they do to earn a livelihood? The only suggestion proposed is the possibility of working in the new industries such as mines, but these options are neither available now, nor are they necessarily desired or healthy. They also do not fit with local culture, as the experiences of Nalunaaq have shown.

Nalunaaq is the site of a small gold mine in south Greenland. The mine has been in operation for at least ten years, but it has not succeeded in filling more than half of the 100 jobs with Greenlandic workers. Some of the reasons for the difficulty in keeping Greenlandic workers are cultural; most people do not wish to live long-term in barracks with only short visits home with their families; they also refuse to accept the working conditions found in the mine. If the Nalunaaq mine has failed to attract and keep Greenlandic workers, the question of what success future mines will have should be asked.

Still, if the young people or men do decide to leave the settlements for work, the next question is where will they live? Waiting lists for public housing are very long and public

housing is also very expensive. In Nuuk, the housing list is reputed to be decades-long. In Upernavik, one informant spoke of her mother waiting a very long time for a house from the public housing list, and once one (in very poor condition) was available, the rent was 8000 DKK per month; an expense well beyond her means.

Communities will also be impacted through a further reduction in the traditional practice of sharing meat and food among community members. This practice of meat gift-giving is still important in the North, especially in the settlements. The supplementary income earned through fishing income helps hunters meet these social obligations and customs of generalized reciprocity (From et. al 1975).

The rise of *anomie* from lack of opportunities combined with stress from changing social conditions such as through not being able to meet obligations of reciprocity, or being forced to migrate for employment should not be underestimated. Anomie is “defined as a state or condition of individuals or society characterised by a breakdown of social priorities and values” (Waldman 2010:1).

Migration and movement, combined with “poor social ties and large, unpredictable events” can evoke *anomie* (Kelly 2003: 468). As Kelly describes (2003), Emile Durkheim, a French sociologist, used the term in his work to “describe a state in which norms are confused, unclear or absent, and where there are large-scale social changes that the individual cannot understand, let alone control” (Kelly 2003: 468). Though Kelly is writing about mental illness and Durkheim spoke of suicides, the concept is an important one for resource-dependent communities, especially in this era of globalisation.

In a world in which the life of the individual is shaped by global events which seem to lie beyond the individual's control, feelings of *anomie* increase (Kelly 2003). Symptoms of anomie can be seen socially through rising crime rates and increased substance (alcohol and drug) abuse. This has been documented in declining resource dependent communities such as in fisheries, forestry, and mining (Wilson 1998). Thus, it would appear Upernavik residents could be faced with feelings of *anomie* in the future, just as Greenlandic society could probably be said to have faced it in the past with its history of colonization and forced migration (From, et. al. 1975).

In considering the community, the issue of social grants should also be considered. In Upernavik there is a tradition whereby when a fisher receives a social grant from the municipality, Upernavik Seafood helps ensure this money is paid back in installments each time the fisher sells fish. This means that social grants are used as a sort 'thrift institution'. As a result of this system, Upernavik appears to have one the lowest social grants per capita in all Greenland. Yet if the hunters and fishers loose their opportunity to sell fish, the social grant averages in the district will increase to at least the national levels, straining municipal resources.

Also, the value of the subsistence economy should not be underestimated. A number of vital goods and foods are obtained through hunting and bartering in their informal economy which wages can not make up for.

Finally, the vulnerability seen in the form of climate change can not be overlooked. Often, it is the cumulative impacts which thrust communities over the edge from healthy to struggling communities (Delaney 2007). For example, when fisheries management introduced the cod recovery plan for North Sea cod, it was not only the new regulations which impacted fishers, but the measures on top of other management plans (e.g. plaice and sole long term management plan) and increasing fuel costs. Often one challenge can be met, but cumulative impacts may prove too much.

In Upernavik, and indeed all of Greenland, climate change is a serious issue. Changes in wildlife migratory patterns and sea ice coverage, for example, should also be considered when investigating livelihoods and community sustainability.

7. Conclusions

Upernavik district's economy is one of contradictions. Outside of the public employees of Upernavik town, Upernavik society remains very much one of a subsistence economy and way of life, supplemented with the selling of halibut for cash. Yet Greenland's central administration is interested in promoting and enforcing a 'modern society' with an economy-oriented frame of reference. Joining the two realities is challenging (Hendriksen and Jørgensen n.d.).

Such societies as this Greenlandic one often have traditional networks used for bartering and trade, often for social and cultural reasons, not simply for simple economic expedience and to deliberately cheat on a contemporary government with a formal tax system. In Upernavik, the meat and parts of marine mammals such as seals and whales, and rarely a polar bear skin, may be sold "outside the system" for societal and cultural reasons.

Hunters and fishers in Greenland are self-employed. This means that they may deduct documented business expenses such as gasoline, ammunition, and fishing gear for tax purposes. Consequently, most hunters with a taxable income end up having a tax liability very close to zero, even though they have had a reasonably good halibut catch. Thus, on paper, it appears they do not contribute to 'community' (tax) or gross domestic product (GDP) and are perceived as unproductive and unprofitable for greater Greenland society (Hendriksen and Jørgensen n.d.).

Yet seen from the perspective of the local community, these individuals are good citizens who contribute to the family and the village with their catch. Historically, the rulers (first Denmark, and later the central Greenland) have looked down upon such peripheral districts, and have tried various incentives to encourage locals to leave these areas, such as through the centralization policies. Their insistence that these individuals contribute tax for the development and servicing of Greenland's major cities is a limited economic perspective and one which follows an old-fashioned, and often failing, model of development (Hendriksen and Jørgensen n.d.).

There is an unspoken tension between the central government and the district's inhabitants, who are rooted in different ways of seeing the world and lack of understanding and insight into the other's perspective. This is a classic center-periphery contradiction, and it is replayed in a number of third world countries and countries with indigenous populations around the world (Hendriksen and Jørgensen n.d.).

In visits to Upernavik district in March-April and July-August of 2011, none of the fishermen and hunters interviewed was aware of the details of the new management plan for Greenland halibut. This is despite the fact at the time was one of the 'hot topics' in the central administration and the press. When such plans are made available, they are always, as one interviewee reported, prepared by Danes, who are not familiar with their Greenlandic lives, and always in Danish. It is unusual for such reports to be translated, and if they are, they will be translated into a Greenlandic which local fishermen do not understand. Also, they commented that politicians and officials rarely, if ever, visit the

district. If they do visit, it will only be for a short time and without the possibility for locals to ask questions or talk about their lives (Hendriksen and Jørgensen n.d.).

When people do not know that great change is coming their way, they can neither relate to these changes nor develop a strategy to mitigate the negative impacts. Most locals see the plan as simply another in a long series of key measures over the years and cannot see how this may actually be drastically different from measures of the past. The fishers are assuming that in practice it does not get the great importance and that life can continue as before.

Such assumptions by the locals may inadvertently increase the negative effects of the management plan since fishers are unprepared and un-comprehending. Yet, it is management which must ensure stakeholders are informed and given the opportunity to comment on management plans; management needs to be transparent in their actions. Management plans need to fully encompass needs of all the various subgroups and ensure equity. Management also needs to conduct thorough social and economic analyses to make sound decisions based upon scientific advice.

In order for management to be successful, it needs to follow the practices of good governance. Good governance is participatory and is based upon, among other points, social equity, responsiveness, and transparency (UNEP n.d.). It is also responsive to the present and future needs of society (UNEP n.d.).

With the Greenland halibut plan, APNN has the opportunity to work for the betterment of all of its citizens, including those most vulnerable. Up until this point in time, the process has not been particularly transparent nor has it included stakeholder participation with all groups. Since the plan has not yet been implemented, however, there is still time to follow good governance practices for the sustainability of not only the Greenland halibut stock, but also for Greenlandic society.

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Annex

Fishery Law § 10

The parliament can with the aim of the administration of the exploitation of the resources make regulations of the Greenlandic Fishery, jv § 6 and § 8. In the implementation of these regulations available catch sizes, the present catch capacity, professional groups and an appropriate geographical development of the fishery profession can be considered, and rules can be made regarding:

- 1) Division of the available quotas according to time, areas, professional groups and fleet segments
- 2) Distribution of available quota with further decision of quota for professional groups, fleet segments and gear together with quota shares or yearly quotas for individual vessels.
- 3) The maximum fishing time, the number of landings and the allowed catch per landing
- 4) Obligation to report catches in line with measures according to 1)-3)
- 5) The maximum catch capacity to be inserted in a given fishery
- 6) Division into fleet segments and professional groups